CHAPTER 3
OPERATOR MAINTENANCE INSTRUCTIONS

SECTION I. TROUBLESHOOTING

3.1 TROUBLESHOOTING PROCEDURES.

Following are troubleshooting procedures for problems which may be encountered with MILES 2000 M2/M3 configuration. Operator troubleshooting procedures involve identifying a problem and isolating the problem to the most likely piece(s) of equipment. Generally the BIT run by the MILES 2000 Control Unit (CU) identifies most problems within the system and produces an error message to let the user know that there is a problem. Table 3-1 lists the error messages that are available; the MILES 2000 equipment malfunction most likely to cause the error message; and the appropriate action to take to correct the problem. You may notice that, much of the time, the corrective action to be taken to resolve a problem is to remove the malfunctioning equipment and replace it with equipment that is working. This is because the MILES 2000 equipment is designed to need only limited maintenance at the operator and/or unit level. When the removal and replacement of equipment can be efficiently expedited, down time can be cut dramatically and participants can quickly return to the mission scenario, allowing them to receive maximum benefit from training. Removal and replacement procedures are located in this chapter in Section II , Operator Maintenance.

WARNING

To prevent personal injury, turn all system power off on the CU before conducting any removal/replacement procedures.

You may encounter equipment problems not addressed in this section. If this is the case, notify the appropriate personnel (a supervisor and/or higher echelon maintenance personnel) as soon as possible.

Table 3-1. MILES 2000 Troubleshooting Chart for the M2/M3 Configuration.

PROBLEM	PROBABLE CAUSE(S)	ACTION
No power to MILES 2000 - No LEDs lighted on Power Controller.	Connection from System Cable not secure or connectors damaged.	Check System Cable connection at Power Controller, tighten if loose. Ensure connector is not damaged and that there is no debris or foreign objects in connector. Check System Cable connection to vehicle slave receptacle, tighten if loose. Ensure connector is not damaged and that there is no debris or foreign objects in connector.
	Power Controller	Check Power Controller. If no LEDs lighted, remove and replace power controller.
	System Cable	If problem still exists, remove and replace system cable. If problem still exists, refer problem to higher echelon maintenance.
BATTERY POWER LOW LED lighted on Power Controller.	Batteries not fully charged.	Remove and replace Power Controller.
BIT FAILURES	**PROBABLE CAUSE**	**ACTION**
Control Unit (CU) Memory	CU	Remove and replace.
CU RTC	CU	Remove and replace.
CU Voice Chip	CU	Remove and replace.
CU Display	CU	Remove and replace.
NV RAM	CU	Ask controller to check settings for vehicle, to ensure Pk tables are correct, and to ensure that the correct vehicle configuration is loaded. If problem still exists, remove and replace CU.

Table 3-1. MILES 2000 Troubleshooting Chart for the M2/M3 Configuration - Continued.

PROBLEM	PROBABLE CAUSE(S)	ACTION
No Universal Laser Transmitter (ULT) Commo	ULT	Check connections; Retest. If error is repeated, remove and replace.
ULT EPROM	ULT	Remove and replace.
ULT Memory	ULT	Remove and replace.
ULT Laser	ULT	Remove and replace.
ULT COAX No Blank	ULT	Load blanks.
No Kill Status Indicator (KSI) Commo	KSI	Check connections; Retest. If error is repeated, remove and replace.
KSI Memory	KSI	Remove and replace.
Strobe	KSI	Check connections; Retest. If error is repeated, remove and replace.
Optical Turret Positioning Device (OTPD) Battery Low	OTPD	Replace battery with standard 9 Volt battery. Retest. If error is repeated, remove and replace.

Table 3-1. MILES 2000 Troubleshooting Chart for the M2/M3 Configuration - Continued.

PROBLEM	PROBABLE CAUSE(S)	ACTION
No Optical Turret Positioning Device (OTPD) data.	OTPD	Check position of OTPD to ensure it is properly placed; Retest. If error is repeated, replace the OTPD battery with a standard 9-Volt battery. Retest. If an error is repeated, remove and replace.
Right Belt	Detector Belts	Remove and replace right from detector belt.
No Attached TOW comm.	TOW	Check connections; Retest. If error repeats, remove and replace TOW Tracker Head Assembly.
Individual Weapons Systems (IWS) Display	IWS Console (DPCU)	Check connections; Retest. If error repeats, remove and replace Torso Harness.
IWS Memory	IWS	Remove and replace Torso Harness.
IWS Detector/AMP	IWS	Remove and replace Torso Harness.

SECTION II. OPERATOR MAINTENANCE

3.2 OPERATOR MAINTENANCE PROCEDURES.

Much of the operator maintenance for the MILES 2000 equipment consists of removing the defective item and replacing it with functioning equipment. Remove/Replace procedures for the M2/M3 configuration are included below:

WARNING

To prevent personal injury, turn all power off before conducting any removal/replacement procedures.

3.2.1 Remove/Replace Procedures for Individual Weapons System (IWS). Before conducting any remove/replace procedures, turn all power OFF.

3.2.1.1 CVC Helmet Harness Assembly Removal.

a. Loosen the harness ends.

b. Detach each fastener strip of the harness from the helmet.

c. Remove the harness from the helmet.

d. Clean the harness and place it in the transit case.

e. Fill out the appropriate form stating the problem and place the form in the transit case with the equipment.

3.2.1.2 CVC Helmet Harness Assembly Replacement.

a. Adjust the harness so the three (3) patches of fastener tape inside line up with the (3) three pieces on the helmet. Ensure there are no wrinkles or twists in the harness.

b. Press the tape on the harness firmly against the tape on the helmet.

3.2.1.3 Torso Harness Assembly Removal.

a. Remove the Torso Harness.

b. Remove the battery from the IWS Console (DPCU), (PN 147421 only.)

CAUTION

Ensure battery door is securely closed during storage and operations, or damage can occur to the battery door.

c. Clean the equipment and prepare for turn in.

3.2.1.4 Torso Harness Assembly Replacement.

a. Locate the IWS Console (DPCU) on the Torso Harness.

b. For PN 147421, install the 9-volt battery in the IWS Console (DPCU) by loosening the thumbscrew and opening the battery door. Insert battery and secure the battery door using the thumbscrew.

CAUTION

Ensure battery door is securely closed during storage and operations, or damage can occur to the battery door.

WARNING

To prevent personal injury, turn all power off before conducting any removal/replacement procedures.

3.2.2 Remove/Replace Procedures for M2/M3. Before conducting any remove/replace procedures, turn all power OFF.

3.2.2.1 Right Front Detector Belt Removal.

a. Disconnect the System Cable from the detector belt connector.

b. Working with short sections, detach the detector belt from the fastener tape on the vehicle. Work carefully so that no electronics or wiring are damaged during removal.

c. Clean equipment and prepare for turn in.

3.2.2.2 Right Front Detector Belt Replacement.

a. Working in short sections, press the detector belt against the fastener tape. Work carefully so that no electronics or wiring are not damaged during replacement.

b. Once the belt is installed, attach the System Cable connector to the belt connector.

c. Safely secure cable using fastener tape tie-wraps.

3.2.2.3 Left Rear Detector Belt Removal.

a. Disconnect the System Cable from the detector belt connector.

b. Working with short sections, detach the detector belt from the fastener tape on the vehicle. Work carefully so that no electronics or wiring are damaged during removal.

c. Clean equipment and prepare for turn in.

3.2.2.4 Left Rear Detector Belt Replacement.

a. Working in short sections, press the detector belt against the fastener tape. Work carefully so that no electronics or wiring are damaged during replacement.

b. Once the belt is installed, attach the System Cable connector to the belt connector.

c. Safely secure cable using fastener tape tie-wraps.

3.2.2.5 Kill Status Indicator (KSI) Removal.

a. Disconnect the System Cable from the KSI connector.

b. Disengage the rubber latches holding the KSI to the adapter.

c. Detach the KSI from the adapter.

d. Clean equipment and prepare for turn in.

3.2.2.6 Kill Status Indicator (KSI) Replacement.

a. Place the KSI on the adapter; ensure that is firmly seated.

b. Pull up and attach the rubber latches to the latching brackets on the KSI.

c. Connect the System Cable to the KSI.

3.2.2.7 DIFCUE Removal. Refer to TD 9-6920-893-10 for DIFCUE removal instructions.

3.2.2.8 DIFCUE Replacement. Refer to TD 9-6920-893-10 for DIFCUE replacement instructions.

3.2.2.9 Coax Microphone Removal.

a. Disconnect the System Cable from the Coax Mic.

b. Unclip the Coax Mic from the machine gun barrel, taking care not to damage the equipment.

c. Detach fastener tape securing Coax Mic Cable to the vehicle and remove the cable and Coax Mic.

d. Clean the equipment and prepare for turn in.

3.2.2.10 Coax Microphone Replacement.

a. Feed the Coax Mic and cable through the main gun breech. Leave the connector end of the cable at the mouth of the main gun breech.

b. Clip the Coax Mic to the machine gun barrel. Ensure that the Coax Mic Cable is not in contact with the barrel.

c. Secure the cable out of the way as needed.

3.2.2.11 Universal Laser Transmitter (ULT) Removal.

a. Disconnect the System Cable from the ULT.

b. Unscrew the bolts from the adapter rings and open the rings.

c. Remove the ULT and adapter from the gun trunnion.

d. Clean the equipment and prepare for turn in.

3.2.2.12 Universal Laser Transmitter (ULT) Replacement.

a. Unscrew the bolts from the adapter rings and open the rings.

b. Place the adapter rings over the main gun trunnion (with the largest ring and the ULT connector to the rear of the gun).

c. Close the adapter rings and secure with the bolts.

d. Adjust the ULT and adapter as needed for proper sighting.

e. Connect the System Cable to the ULT.

3.2.2.13 TOW Simulator Tube Removal.

a. Unlatch the TOW Simulator Tube from the Missile Launcher.

b. Remove the TOW Simulator Tube, taking care not to damage the equipment.

c. Clean the equipment and prepare for turn in.

3.2.2.14 TOW Simulator Tube Replacement.

a. Load the TOW Simulator Tube into the Missile Launcher and latch into place.

b. If the display for the TOW does not indicate a missile is present, reseat the missile as firmly as possible.

3.2.2.15 Control Unit (CU) Removal.

a. Disconnect the System Cable from the CU.

b. Detach the CU from the vehicle, taking care not to damage the equipment.

c. Clean the equipment and prepare for turn in.

3.2.2.16 Control Unit (CU) Replacement.

a. Apply fastener tape to the CU if there is none.

b. Mount the CU on the vehicle.

c. Connect the System Cable to the CU connector.

3.2.2.17 Power Controller Removal.

a. Disconnect the System Cable from the Power Controller.

b. Detach the Power Controller from the vehicle, taking care not to damage the equipment.

c. Clean the equipment and prepare for turn in.

3.2.2.18 Power Controller Replacement.

a. Apply fastener tape to the bottom of the Power Controller if there is none attached.

b. Attach the Power Controller to the vehicle.

c. Connect the System Cable to the Power Controller connector.

3.2.2.19 Shorting Plug Removal.

a. Remove the shorting plug from underneath the gun mount and loosen the fastener tape loop.

b. Turn the connector ring on cable 2W10 counterclockwise and disconnect the shorting plug.

3.2.2.20 Shorting Plug Replacement.

a. Inspect connector assembly for damage.

b. Replace the shorting plug using the installation procedures in paragraph 2.3.2.11.

3.2.2.21 System Cable Removal.

a. Disconnect cable from all units and other cables.

b. Detach the fastener tape securing the cable to the vehicle.

c. Remove the cable, taking care not to damage the cable or connectors.

d. Clean the cable and prepare for turn in.

3.2.2.22 System Cable Replacement.

a. Replace the cable using the instructions in paragraph 2.3.2.12.

b. Secure the cable to the vehicle using fastener tape tie-wraps.

3.2.2.23 Optical Turret Positioning Device (OTPD) Removal.

a. Detach the OTPD from the vehicle, taking care not to damage the equipment.

CAUTION

Ensure battery door is securely closed during storage and operations, or damage can occur to the battery door.

b. Clean the equipment and prepare for turn in.

3.2.2.24 Optical Turret Positioning Device (OTPD) Replacement.

a. Apply fastener tape to the bottom of the OTPD if there is none.

b. Position the OTPD so the arrow points to the front of the vehicle and turret.

c. Run BIT to verify correct position of OTPD. (Reposition if necessary.)

d. Attach the OTPD to the vehicle.

3.3 MILES 2000 EQUIPMENT DISASSEMBLY PROCEDURES.

Perform the following procedures to remove and store the M2/M3 equipment. Always ensure that all power to the equipment is OFF before disassembly.

3.3.1 Disassembly Procedures for M2/M3.

a. Disconnect System Cable and remove it and all MILES 2000 equipment in accordance with the removal procedures in Section II of this chapter.

b. Remove batteries from applicable equipment.

c. Clean and inspect equipment. If there is any damage to the equipment, report damage on the appropriate form (a separate form for each piece of equipment), and turn in with damaged equipment.

d. Place equipment and System Cable(s) in the Transit Case.